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Book Review

James Clerk Maxwell. A Biography

IVAN TOLSTOY
Canongate, Edinburgh, 1981. 13.5 × 22 cm, 184 pages, £9.95*

In this 150th anniversary year of the birth of James Clerk Maxwell the appearance of a new biography is both appropriate and welcome. Welcome because the author has followed an approach to his subject distinctly different from previous biographers, to whom he gives generous acknowledgment. His modestly phrased aim is that it 'pretends neither to be a definitive biography, nor a work of historical scholarship. It is, rather, a book for the lay reader'. But it is not merely that, because in stressing the whole Maxwell Professor Tolstoy has, to use the modern metaphor, shown what made him 'tick', as far as is possible in writing about an essentially 'private man'. The influences of his boyhood, with its somewhat rugged upbringing, his early blossoming into a theoretical physicist who was nevertheless an adept experimenter, his university posts, his marriage and his deep religious convictions, are sensitively and perceptively woven together. The reader (or this reviewer at least) thus feels that a revealing window has been opened on the real Maxwell.

Professor Tolstoy, himself a distinguished applied mathematician and goephysicist who was trained and has worked in both Europe and the United States, deals with university life of the middle of the last century in an absorbing way. He concludes that while Maxwell seems not to have been a good lecturer—and indeed was found frequently difficult to follow in conversation by all except his peers—his powers of exposition on paper were of the highest clarity possible in abstruse subjects. He appears to have been rather at sea in the politics of academe but on the credit side his planning and supervision of the Cavendish Laboratory is impressive.

But this is not just another biography of an 'eminent Victorian'—how could it be when so much needs be interpreted of the towering scientific contributions of Maxwell, albeit with the lay reader in mind? If the physicist wishes to go deeply into these matters, the annotated bibliography indicates the recognized sources. However, for the engineer, the 'mix' is about right.

Throughout the book one is amazed at the range of subjects on which Maxwell worked and published significant results. Thus we learn of the early work in geometry, the prize for explaining the stability of the rings of Saturn, the dynamical theory of gases, experiments on colour vision, and then of the gradual evolution of the electromagnetic theory of light and its mathematical development in the famous equations. Later on came the 'Treatise on Electricity and Magnetism', the theory of governors, more work on gases, and a paper on Boltzmann's theorem which was significant in founding statistical mechanisms.

Though not in the generally accepted sense a polymath, the descriptions, 'a physicist's physicist' given by Professor Tolstoy and 'the complete physicist' taken by Professor R. V. Jones for the title of his Memorial Lecture, both sum up a scientist of the first rank whose three decades of productive work changed the face of natural philosophy.

The book is readable and well written: the production is dignified and the few printer's errors noted will not mislead (nor, probably, will the placing of Keswick first in the Lake District, and in the next paragraph in the Peak District!). It is warmly recommended to the dedicated readers of biographies and it will be found revealing and rewarding reading for those who seldom feel inclined to spare time for other than technical matters. The coincidence of the publication of Professor Jones's Memorial Lecture in this issue of the Journal provides a shorter but complementary account which may well lead the latter category of radio and electronic engineers to want to know more about the scientist to whose work their profession owes so much.

F. W. SHARP

*The publishers are offering this book to members of the Institution at the special price of £7.95 post free until 31st March 1982. Send cheques or postal orders to Canongate Publishing, 17 Jeffrey Street, Edinburgh EH1 1DR marking 'IERE Offer' on the envelope.